

# NASA TechTracS

## Detailed Design Document



*Access to Agency Wide NTTS Server  
Modification (Mod 54)*

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**Introduction**

This modification to NASA TechTracS was requested in a Work Request from Dianne Cheek of NASA Langley Research Center, on August 28, 1998 and is designated as Mod 54.

It consist of changes and additions to existing data structures and revisions to displays, reports and processes.

This detailed design document contains sufficient information to complete the software development construction for Mod 54 and includes a detailed user interface mock-up. It also specifies the changes required to the user documentation and defines a quality assurance plan.



## **Design Status**

**03/07/2000**

Submitted for initial design approval. Corrections made.

**03/16/2000**

Submitted for Technical Review. Corrections made

**03/16/2000**

Submitted to Dianne Cheek of NASA Langley Research Center for client Review.

**mm/dd/yy**

Items added to Issue table. Items resolved

**05/22/2000**

DDD approved. Construction begins

**mm/dd/yy**

Construction Completed. Testing begins.

**mm/dd/yy**

Testing Completed

**mm/dd/yy**

Delivered into production with Release FY 2000.02



## Design Overview

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54.02.03.05	Development/Operational Environment





**Reuse Strategy**

Since this development effort is primarily a series of modifications to an existing module in NASA TechTracS, extensive re-use of existing forms and reports will be made. The tools and objects currently in use in NASA TechTracS will be employed where appropriate. These include:

- Custom find methods
- Streamlined relate methods (Relate pop-up)
- Page navigation methods (More pop-up)
- Record navigation methods (Record pop-up)
- List Manager pop-up menus
- Full screen text edit windows
- People and Company autolinking (Business Card buttons)
- Keyword management module
- Auto Agent/Personal Agent batch processing
- Record maintenance audit (I button)
- Standard List window methods
- Standard Record window methods



## Quality Assurance

In order to maintain high quality design and construction the following QA elements will be incorporated:

- All program code must adhere to defined standards, especially in the area of method, form and object naming conventions. The support website contains details of these in the "Coding and Structure Rules" link. More in depth programming standards are also on the support site via the "KSS 4D Programming Rules"
- All system interfaces must also adhere to NASA defined standards. The support website contains these "NASA TechTracS Interface Standards".
- All errors discovered during any formal testing will be recorded in the online Bug Reporting System. This will help ensure that errors are not identified more than once and that they are properly resolved.
- Unit Tests of discrete components will be performed by the developer. These components will be identified in the Detailed Development Plan. As far as is practicable, the goal of this testing is to prove that a given software component performs as designed before it is exposed to the larger environment of integration or system testing. For example, each method should be unit tested to verify proper use of passed parameters and, if appropriate, returned results. Developers will also verify that the components adhere to the Component Checklists as part of the Unit Test. See the Component Reviews below for more details.
- Developers will perform source code tracing where appropriate to prove that the code executes as expected. Research has shown that regular use of source code tracing and unit testing will identify many errors early in the development cycle. Errors identified early are more easily and more cost-effectively resolved.

- Component Reviews will be conducted by an appointed reviewer(s) and reported to the developer. The Component Review Checklists will be used to ensure consistent review quality. Once a component has passed its review, it may participate in integration testing. Part of the review will include an analysis of the component by scanning TechTracS source with SanityCheck from Foresight Solutions. SanityCheck is an application that will perform a read-only scan of the 4th Dimension™ structure file. SanityCheck sifts through the structure file looking for common programming problems as well as checking the integrity of all objects (Forms, Methods, etc) within the structure file. The component checklists are also available on the support site for the following links: Construction Component Checklist", "Form Checklist", "Structure Checklist", and "Code Checklist".
- Integration Tests will be conducted to ensure that all new or modified components perform as expected when combined with other elements of NASA TechTracS. Due to the integrated nature of the TechTracS development process, extensive, detailed integration testing is inappropriate. However, sufficient testing should be performed to ensure compatibility with other components of the system.
- System Tests will be combined with testing of other modifications that are scheduled for the same release. A system test sequence will be developed to fully validate that the modifications have been properly implemented. After release, the system test sequence should be incorporated into regression test plans for future modifications.

**User Manual**

There will be new documentation on the use of the Access to the Agency Wide NTTS Server.



## **Design Methodology**

Since this is a new NASA TechTracS module, the standard NASA TechTracS Design Methodology shall be followed/reused. See the support site for these standards.

The standards currently used in NASA TechTracS will be employed and extended as detailed herein:

- The "Link to Agency Wide" window will only connect to the server when the Query button is clicked. After the results of the query display, the connection to the Agency Wide server is dropped.
- A single user login name and login password is used to connect to the Agency Wide server for the query.
- A user must be in the Center's Agency Wide System users group to gain access to the "Link to Agency Wide" window.





## Development and Operational Environment

Modifications to TechTracS are required to be compatible with the following processors and operating systems:

1. Intel Pentium - Windows 95, Windows 98, Windows NT 4
2. Motorola PowerPC - Mac OS 8.x



## Requirements Matrix

The Requirements Matrix is key map denoting what areas of development are necessary to fully satisfy the requirements. The "Req." column refers to the Requirement Number corresponding to that used in the Requirements Document for this mod. The remaining columns list the Structure, Record Form/Custom Dialog, List Form/Find Dialog, Custom Report and Major Method/Other items created or modified to meet the specified requirement number. Details on these items can be found in the Detailed Development Plan section.

Requirements Matrix

Req.	Structure	Record Form	List Form	Report	Methods / Other
1.					
2.					<b>MenuBar #2 AWA_Manager</b>
3.	[Consants]AWA_ Username [Consants]AWA_ Password	[Technology]AW_ Access  [Constants]Input "Wide Area Network Control"			<b>AWA_doLink_ dlg</b>
4.					
5.		[Technology]AW_ Access			<b>AWA_doQuery AWA_Connect AWA_Tech_Srch</b>



## Detailed Development Plan

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**Introduction**

This Modification is a new feature of the existing TechTracS function. The changes include the creation of a new display forms to allow viewing of Agency-Wide data.





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**Structure**

In order to support the requirements of this modification, changes and additions to the existing NASA TechTracS database structure must be performed.

**[Constants]**

**Structure Revision:** Modification

**Table Name:** [Constants]

**OkToAddRecords:** No

**OKToDeleteRecs:** No

**HQ WAN:** Yes

**NTAS WAN:** No

**Description:** The [Constants] table is the primary data repository for TTS baseinformation. The following fields are new.

[Technology ] Structure Modifications

Req.	Field Name	Description	Type
3.	[Constants]AWA_Username	Identifies the single user name used to access the Agency Wide server from NASA centers	Alpha 10
3.	[Constants]AWA_Password	Identifies the password used to allow access the Agency Wide server from NASA centers	Alpha 10



Record Forms/Custom Dialogs

The following Record and Custom dialog needs to be added as result of this mod.

[Constants]Input

<b>Form Name:</b> [Constants]Input
<b>New or Modified:</b> Modified
<b>Menu Bar:</b> -2
<b>Description:</b> Modified page to store username and password to access the Agency Wide server for [Technology] queries.

Page(s)		
Page Number	Name	New
8.	Wide Area Network Control	No

**Page Number:** 8**Page Name:** Wide Area Network Control**Method(s):** None**Fields Used on Page 8**

<b>Req.</b>	<b>Field Name</b>	<b>Label</b>
3.	[Constants]AWA_Username	User Name
3.	[Constants]AWA_Password	Password

**Other Objects Used on Page 8**

None

**Special Processing on Page 8**

None

Mockup of [Constants] Wide Area Network Control screen

Constants: 1 of 1 records in selection

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**Wide Area Network Control**

<input checked="" type="checkbox"/> Activate WAN data collection	Network Protocol	TCP
<input checked="" type="checkbox"/> Log WAN Errors Only	Burst Maximum (recs)	500
<input checked="" type="checkbox"/> AutoWAN Inventory Records	Cycle Delay (mins)	2
<input checked="" type="checkbox"/> Hold Multimedia Records	<input type="checkbox"/> Clear Binds After Each Cycle	
<input type="checkbox"/> Lead Email Notification	<input type="checkbox"/> Hold Connection Open	
	<input checked="" type="checkbox"/> Forward to Upstream Servers	

**TechTracS Server 1**


<input type="checkbox"/> Activate WAN to Server 1	Address	
<input type="checkbox"/> Perform WAN Data Posting		
<input type="checkbox"/> Search & Execute WAN Jobs		

**TechTracS Server 2**

<input type="checkbox"/> Activate WAN to Server 2	Address	
<input type="checkbox"/> Perform WAN Data Posting		
<input type="checkbox"/> Search & Execute WAN Jobs		

**Agency Wide Access**

User Name	Sherry MacMahanny	Password	??????????
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TechTracS

**Left Panel:**

- Accept
- Cancel
- Record
- More
- Print
- Help

[Technology]AW\_Access**Form Name:** [Technology]AW\_Access**New or Modified:** New**Menu Bar:** -2**Description:** Create this form to allow users to view and query Technology data from the Agency Wide server

Page(s)

Page Number	Name	New
1.	Link to Agency Wide	Yes

**Page Number:** 1

**Page Name:** Link to Agency Wide

**Method(s):** AWA\_doQuery is called to process the query (when the query button is clicked)

Fields Used on Page 1

Req.	Field Name	Label
3., 5.	[Technology]Center	NASA Center ... in Query area Title ... in Listing area
3., 5.	[Technology]Case_Number	Case # ... in Query area Case Number ... in Listing area
3., 5.	[Technology]Application_SN	Application Serial # ... in Query area Serial # ... in Listing area
3., 5.	[Technology]Patent_Number	Patent #
3., 5.	[Technology]NTR_Title	Title (Keywords) ... in Query area Title ... in Listing area
5.	[People]First_Name	Innovator First Name
5.	[People]Last_Name	Innovator Last Name

## Other Objects Used on Page 1

Req.	Type	Description
5.	Button Query	Used to initiate a query to the Agency Wide server for [Technology] records matching the search criteria
3.	Scrollable Area	<p>Each of the values returned from the search is place in the appropriate array. Each of these arrays is assigned a scrollable area. These areas are then grouped together to form one big listing of the results.</p> <p>Note bring the last scrollable area (under "Title" from the mockup) to the front to allow scrolling of the group</p>
3.	Sort Buttons Center, Case #, Serial #, Patent #, Title	<p>The title of each column in the Scrollable area is actually at button.</p> <p>When clicked, the button executes a script which orders the array group by that field.</p>
3.	Pop-up	The Center field is a pop-up of Center names

## Special Processing on Page 1

None



[illegible]



## List Forms/Find Dialogs

There are no List Form or Find Dialog changes required to implement this modification



## **Custom Reports**

There are no Custom Report changes required to implement this modification



## Major Methods

The following methods (including conversion methods) need to be added or modified as result of this mod:

**Method Name:** AWA\_Manager

**New or Modified:** New

**User Method:** No

**Requirement(s):** 02 - Create a new menu item on the Report menu that will allow a user limited access to the NTTS Agency-wide system from their center's local NTTS system.

**Description:** The **AWA\_Manager** method is executed from the Report menu after the user selects the "Connect to Agency Wide..." menu item. **AWA\_Manager** checks to see if the users is in the proper user group; "AWAccess". If the user is allowed to access the Agency Wide server, **AWA\_doLink\_dlg** is called is process the Link to Agency Wide dialog. If the user is not allowed acces to the Agency Wide server then an alert displays indicating that the users should contact their DBA to receive access to the Agency Wide Server.

**Method Name:** AWA\_doLink\_dlg

**New or Modified:** New

**User Method:** No

**Requirement(s):** 03 - Open a window that would display the following fields: NASA Center, Case #, Application Serial #, Patient # and NTR Title.

**Description:** AWA\_doLink\_dlg displays the [Technology]AW\_Access form



**Method Name:** AWA\_doQuery

**New or Modified:** New

**User Method:** No

**Requirement(s):** 05 - From the list window the user can query the [Technology] table on the following fields: NASA Center, Case #, Inventor's Last and First Name, Application Serial #, Patent #, and NTR Title.

**Description:** AWA\_doQuery executes when the user has clicked the query button.

If there is a value in any of the query fields, **AWA\_doQuery** calls the **AWA\_Connect** method to make a 4D Open connection to the Agency Wide server. Then **AWA\_Tech\_Srch** is called process the search fields. When the results of the query is returned and displayed in the dialog window, **AWA\_Connect** is called again to disconnect from the Agency Wide server

If there are no values entered in any of the query fields, **AWA\_doQuery** displays an alert indicating that at least one of the search values

**Method Name:** AWA\_Connect

**New or Modified:** New

**User Method:** No

**Requirement(s):** 05 - From the list window the user can query the [Technology] table on the following fields: NASA Center, Case #, Inventor's Last and First Name, Application Serial #, Patent #, and NTR Title.

**Description:** AWA\_Connect is used to open or close the 4D Open connection (depending on the value passed to this method), called "AW Access", to the Agency Wide server using a single (common) user login.

**Method Name:** AWA\_TechSrch

**New or Modified:** New

**User Method:** No

**Requirement(s):** 05 - From the list window the user can query the [Technology] table on the following fields: NASA Center, Case #, Inventor's Last and First Name, Application Serial #, Patent #, and NTR Title.

**Description:** AWA\_Tech\_Srch takes the value(s) entered and queries the Agency Wide server for matching records. If more than one search value is entered the queries are appended to one another. The final selection of [Technology] records (resulting from the query/queries) are placed into arrays for display on the Link to Agency Wide dialog.

If the selection of Agency Wide [Technology] table records is greater than 200, then display a message indicating that the return limit has been exceeded and only the first 200 will be returned. The message will also suggest to the user could refine their query to come in under the 200 record limit.

The queries performed are denoted below:

A value entered for NASA Center causes a query of the Agency Wide server [Technology] table for records matching on the [Technology]Center field. If a center is not selected ALL centers' records will be searched.

A value entered for Case # causes a query of the Agency Wide server [Technology] table for records matching on the [Technology]Case\_Number field.

A value entered for Application Serial # causes a query of the Agency Wide server [Technology] table for records matching on the [Technology]Application\_SN field.

A value entered for Patent # causes a query of the Agency Wide server [Technology] table for records matching on the [Technology]Patent\_Number field.

## AWA\_Tech\_Srch Method Description (cont'd)

A value entered for Title (Keywords) causes a query of the Agency Wide server [Key Technology] table for records matching on the [Key Technology]Word. This selection is then related to the [Technology] table, producing a selection of [Technology] records

A value entered for Innovator First Name causes a query of the Agency Wide server [People] table for records matching on the [People]First\_Name field. The selection of records is then related to the [Tech\_Innovator] table resulting in a new selection of records that is then related to the [Technology] table, producing a selection of [Technology] records.

A value entered for Innovator Last Name causes a query of the Agency Wide server [People] table for records matching on the [People]Last\_Name field. The selection of records is then related to the [Tech innovator] table resulting in a new selection of records that is then related to the [Technology] table, producing a selection of [Technology] records.

**Other Items**

Below are other items that are required to meet the requirements for this Modification.:

**Item Name:** MenuBar#2

**New or Modified:** Modified

**User Method:** No

**Requirement(s):** 02 - Create a new menu item on the Report menu that will allow a user limited access to the NTTS Agency-wide system from their center's local NTTS system.

**Description:** MenuBar number 2 must be modified. Add a Menu Item named "Connect to Agency Wide..." to an appropriate area of the Report menu. This menu item's method is **AWA\_Manager**. So essentially, when the user selects "Connect to Agency Wide..." from the Report menu, the **AWA\_Manager** method is called to manage access to the Agency Wide Server.



**Appendix**

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## Appendix A - Estimated Hours

Req.	Design	Construction	Testing	Documentation	Tooling	Total
3.	<del>02</del> 04	<del>05</del> 09	<del>02</del> 04	<del>0.5</del> 01.5	00	<del>11</del> 20
5.	<del>08</del> 09	<del>32</del> 36	<del>08</del> 10	<del>12</del> 13	04	<del>64</del> 71
<b>Total Change</b>	<b>03</b>	<b>06</b>	<b>04</b>	<b>02</b>	<b>00</b>	<b>15</b>
<b>New Totals</b>	<del>11.75</del> 14.75	<del>38.75</del> 46.75	<del>15.25</del> 19.25	<del>11.25</del> 13.25	<b>04</b>	<del>80.9</del> 96.9